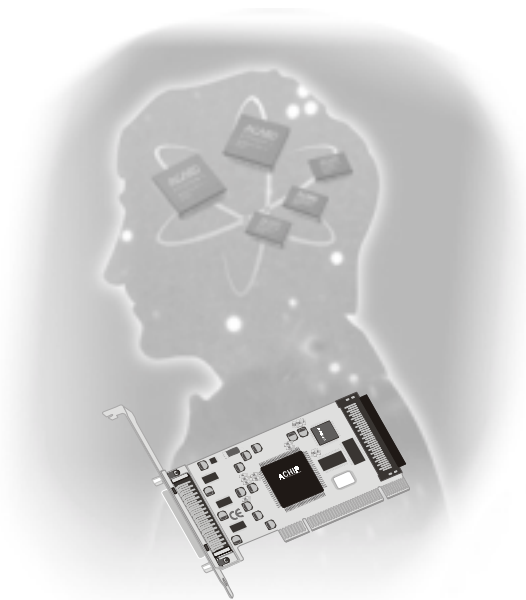


AEC-67160M Ultra160

PCI Ultra160 SCSI Adapter for Macintosh

User's Manual



— Ver:1.0 —

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Chapter 1 Introduction

1.1 Introduction

ACARD technology corp. dedicate to make SCSI interface to be a standard interface in Macintosh with stable function, high transfer rate and very low cost. The ACARD SCSI adapter AEC-67160M is specifically designed to speed up the high perform hard disk drive for server, Internet and RAID system or 3D image, medical imaging, CAD/CAM designer. The AEC-67160M is a high performance PCI Bus to a single channel Ultra160 SCSI, Low Voltage Differential (LVD) adapter.

The AEC-67160M is a high performance PCI-to-Ultra160 SCSI adapter. With full features of the PCI 32-bit bus master transfer capability and PCI enhanced data transfer commands (133MB/s). It offers real PCI Plug and Play, and Scatter/Gather function to improve performance for multi-tasking OS.

The AEC-67160M supports peripheral devices which conform with SCSI-1, SCSI-2 and SCSI-3. For the bootable SCSI adapter AEC-67160, the biggest advantage the adapter is a new generation of SCSI technology that expands SCSI performance from 40 MB/sec to 160 MB/sec. In addition to providing much greater performance, Ultra160 SCSI increases the maximum allowable cable length from 3 meters to 12 meters for improved connectivity and flexibility. It supports Mac OS 8.5, OS 9.x and OS X all with the same firmware.

The key SCSI chip from ACARD is ATP880 32-bit RISC engine which highly integrated with arbitration, disconnect, reconnect, parity generation and checking on both data ports, synchronous data transfers with PCI PnP specification. Also, the SCSI chip allows the ACARD SCSI adapter AEC-67160M to be backwards compatible with previous generations of SCSI products, while allowing newer Ultra160 SCSI devices to operate at the higher 160 MB/sec rate and increased cable length.

1.2 Features

- PCI Bus Master frees CPU from I/O task loading
- Synchronous transfer rate up to 160MB/sec
- Powerful advanced setup function
- Supports multi-threaded and multi-tasking Mac OS X
- Supports Scatter/Gather operation
- Automatic FIFO threshold selection
- Auto termination control
- Device supports:
Hard drive, Removable disk, Optical disk, CD-ROM*, CD-R/RW*, Tape Driver*, etc.
- Supports Mac OS 8.5, OS 9.x and OS X

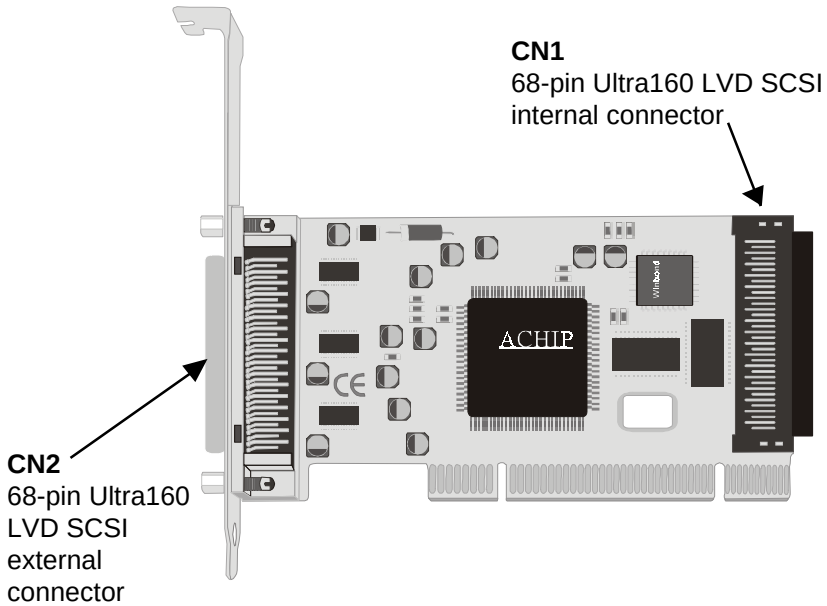
*** Those devices may be supported by other 3rd party driver and/or utility.**

1.3 Specifications

Power Required	-	Voltage: 5V ± 5%		
		Power Consume:	Stand By	Max
			0.4W	2.85W
Environment	-	Temperature		
		Operating: 0° C to 70° C		
Humidity	-	15% to 90%		
Dimensions	-	AEC-67160M	Length:	13 cm
			Width:	6.5 cm
Connector	-	68-pin internal Ultra160 LVD SCSI connector x 1		
		68-pin external Ultra160 LVD SCSI connector x 1		
Terminator	-	Active		

1.4 Board layout

AEC-67160M Board Layout



AEC-67160M:

CN1: Connect to the 68-pin Ultra160 SCSI flat cable to connect the SCSI devices.

CN2: Connect to the 68-pin Ultra160 SCSI round cable to connect the SCSI devices.

Chapter 2 Hardware Installation

2.1 Installing the Ultra160 SCSI Adapter

Step 1: Turn off the Mac computer.

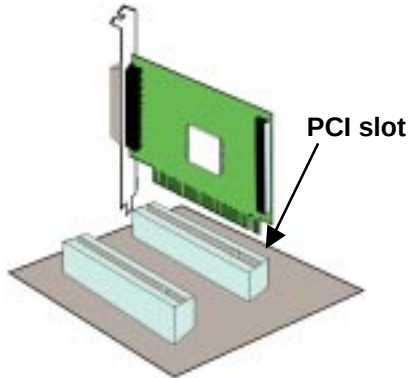
Step 2: Plug out the power core and all the connection of external devices from your system.

Step 3: Referring your original case user's manual to see how to open your case.

Step 4: Select one unused PCI expansion slot of your computer. Unscrew the slot cover and remove it.

Step 5: Remove the SCSI host adapter from the anti-static bag and hold its metal bracket part.

Step 6: Plug the AEC-67160M SCSI adapter card into the unused PCI slot with care on the bottom of edge. Then fit the adapter bracket on case frame just like a slot cover.



2.2 Installing Internal Drives

Power Connection

For internal devices, connect DC core power directly from power supply to device.

Cable Connection

For internal connector

Step 1: Identify number of pins on the connectors, either adapter or device. Then, prepare a ribbon cable whose connectors match your need, e.g. 50-pin to 50-pin, 68-pin to 68-pin, or 68-pin to 50-pin.

Step 2: Find out where each pin-1 of connectors located on the cable and host adapter. Then connect one end of SCSI cable to the connector of host adapter aligning with pin-1 to pin-1.

Note: Usually, a color wire on the edge of cable indicates pin 1 of connector, and a mark also shown on the adapter board.

Step 3: Find out pin 1 of the connector on your device.

Step 4: Select one available connector on the cable, then plug it into your internal device connector aligning with pin-1 to pin-1.

Step 5: If you have two or more devices, please repeat Step 2 and Step 3 to install you remaining devices.

Step 6: Please set the last SCSI device terminator on.

Note: For terminating your internal SCSI device, please refer to your original SCSI device supplier or manufacture.

Step 7: Identify your devices ID number, that is, you have to set all your internal SCSI devices an unique ID number to avoid hardware conflict.

2.3 Installing External Drives

Power Connection

For external SCSI devices, you need to connect the power core to turn on your external device.

Cable Connection

There are two different ways to make external cable connection when connecting to only one device or connecting to more than one devices.

1. Connecting to only one device

Step 1: Identify number of pins on the connectors, either adapter or device.

Then, prepare an external cable whose connectors match your need, e.g. 50-pin to 50-pin, 68-pin to 68-pin, or 68-pin to 50-pin.

Step 2: Plug one end of the high-density external SCSI cable into the host adapter connector.

Step 3: Plug the other end of this SCSI cable into one connector on the SCSI device that you wish to connect.

2. Connecting more than one devices

One of the SCSI features is that you can connect two or more devices simple by place them one after another to the host SCSI adapter serially.

Step 1: Make sure the external SCSI cable is match to the numbers of pin of external SCSI adapter and devices.

Step 2: Plug one end of the high-density external SCSI cable into the host adapter external connector.

Step 3: Plug the other end of the external SCSI cable into one of the connectors on the SCSI device that you wish to connect.

Step 4: Take another external SCSI cable and plug it into the connector of previous device. Connect the other end of the external cable to the next SCSI device that you wish to connect.

Step 5: Repeat Step 4 as number of devices is required to be connected.

Step 6: Disable all SCSI devices' terminators, except leave the end one to be enabled.

2.4 Installing Both External and Internal Drives

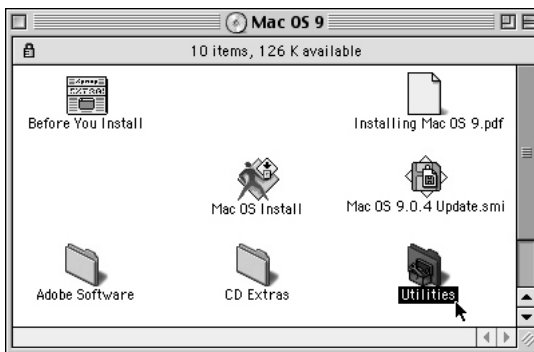
Both external and internal devices can be installed by one adapter at the same time. AEC-67160M, can maximum connects up to 15 devices totally. Please ensure that the last device's external and internal cables.

Chapter 3 System Installation

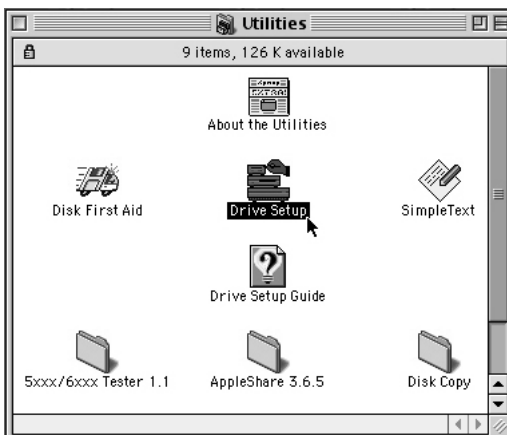
The following example is connected Hard Drive to ACARD's AEC-67160M SCSI adapter to show a proper way of software configuration. Assume that we set an SCSI ID number "0" to AEC-67160M.

3.1 Mac OS 9 installation

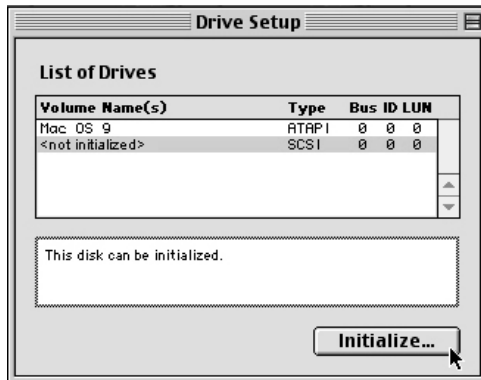
1. Be sure your hardware had install correctly.
2. Insert Mac OS 9 CD-ROM to your Macintosh.
3. Power on your Macintosh and press 'C' key.
4. Enter Mac OS 9 CD icon and the Mac OS 9 window popup.
5. Click on **"Utilities"**.



6. Click on **"Drive Setup"**.

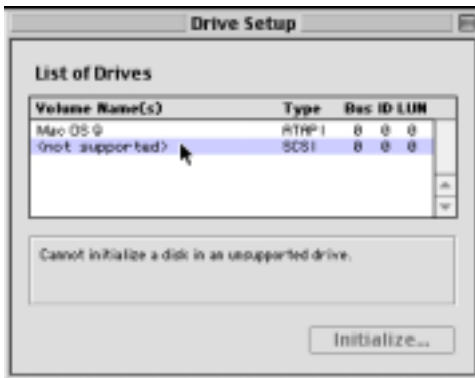


- Choose the hard disk you connect to AEC-67160M, then press **"Initialize"** button.



- Then you can start to install an new Mac OS on the hard drive.

Note: Some of Hard Driver may not be supported (see as below), please refer to your original Hard Drive manufacture to see the solution.



3.2 Mac OS 10.1 installation

1. Be sure your hardware had install correctly.
2. Insert Mac OS X CD-ROM to your Macintosh.
3. Power on your Macintosh and press 'C' key.
4. After Mac OS X Boot up, select "**Installer**" from the top selection tools.
5. Select "**Open Disk Utility ...**" to open it.
6. Click on "**Drive Setup**" and choose the hard drive that you want to initialize.



7. Select the hard drive which you want to initialize and choose "**Partition**" to select the number of partition that you want to be.



8. Then click on the right down of “**Partition**” button to initialize the hard drive.



9. Then you can start to install an new Mac OS X on the hard drive.

Note: For more information about Mac OS X installation guide, please refer to Mac OS X installation manual.

3.3 Verify Hard Drive Initialize

For Mac OS 9.x Environment

You are going to make sure the computer “initialize” hard drive if successfully. When you initialize the hard drive successfully, on the Mac window will show a new “Untitled” hard drive icon.

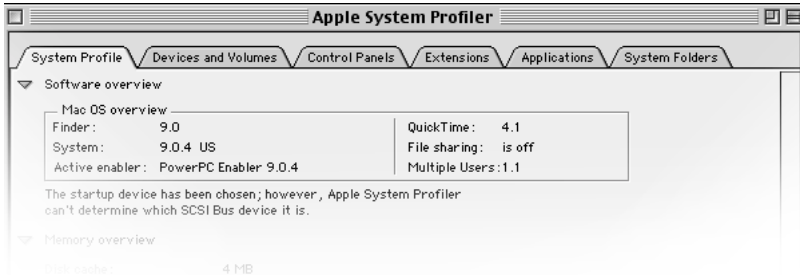


Normally, after the hardware installation, the Mac OS system will detect the SCSI card automatically. For advance Mac users, you may try to find out and check the system information. Follow the instruction below to see how to check the system information.

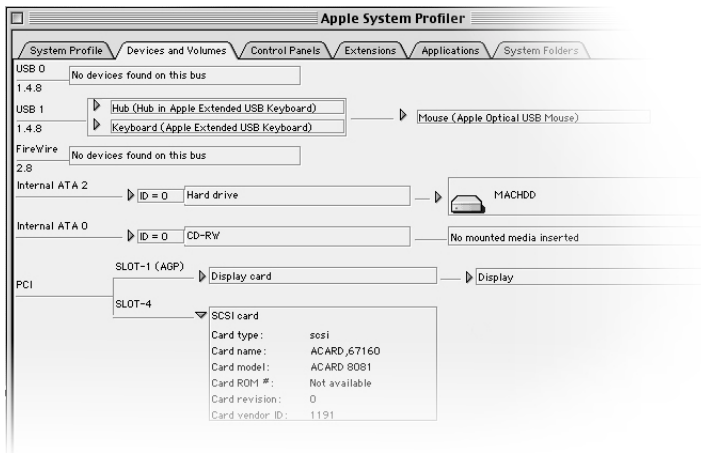
Step 1. Click on Apple Logo and choose “**Apple System Profiler**” to show your hard disk drives information.



Step 2. Under the “**Apple System Profiler**”, you will see the “**System Profiler**”. Choose “**Devices and Volumes**” to see the devices status.



Step 3. Under “**Devices and Volumes**”, please choose “**PCI**” item. You will find the SCSI card installation status.



For Mac OS X Environment

You are going to make sure the computer “initialize” hard drive if successfully. When you initialize the hard drive successfully, on the Mac OS X window will show a new “Untitled” hard drive icon.



Normally, after the hardware installation, the Mac OS X system will detect the SCSI card automatically. For advance Mac users, you may try to find out and check the system information. Follow the instruction below to see how to check the system information.

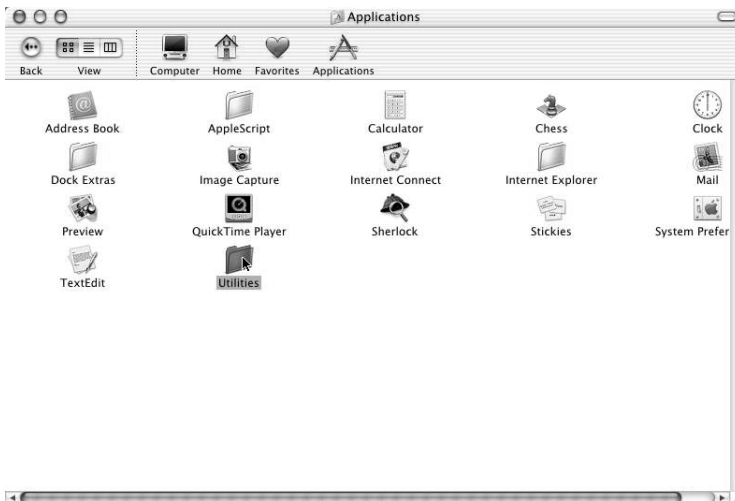
Step 1. Please find the “**Finder**” under the bottom of the MAC OS Screen then click on it to open.



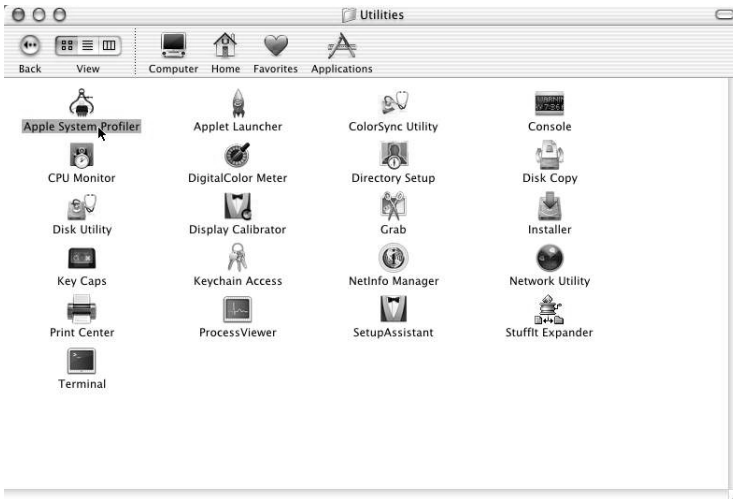
Step 2. Find the “**Application**” sign on the top of the screen and click on to open next window.



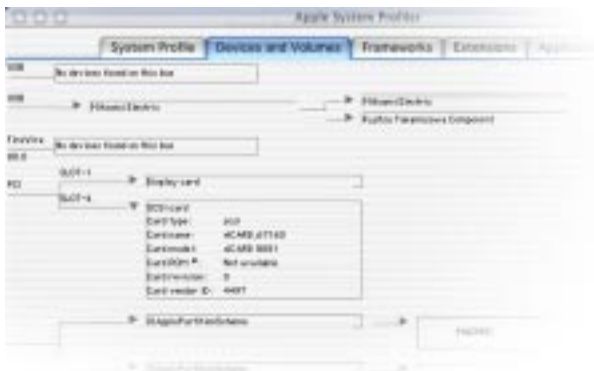
Step 3. Under the “**Application**”, find out the “**Utilities**” item and click on it.



Step 4. Under the “**Utilities**”, you will see the “**Apple System Profiler**”. Click on “**Apple System Profiler**” to see the devices status.



Step 5. Under “**Devices and Volumes**”, please choose “**PCI**” item. You will find the SCSI card installation status.



Chapter 4 Troubleshooting

If you install the AEC-67160M and it does not function properly, follow the troubleshooting below.

1. Check power supply.

When starting to check the malfunction devices, you should check the power status (ON / OFF).

2. Check host adapter.

Verify the adapter card is seated in its slot on the motherboard.

3. Check all connectors and cables.

Check power connector, SCSI connector, IDE connector, device power connector, and ribbon cable are connected well. Ribbon cables are easily damaged because of un-proper fold. You can try a new cable known to be good. Make sure no connector pins are bent. Verify pin 1 on the interface cable is aligned with pin 1 on the drive and host adapter.

4. SCSI ID conflict.

If you have multiple SCSI devices, please make sure that ID of the SCSI device do not duplicate. To reduce the chance the ID switch malfunction, it is recommended to test it individually.

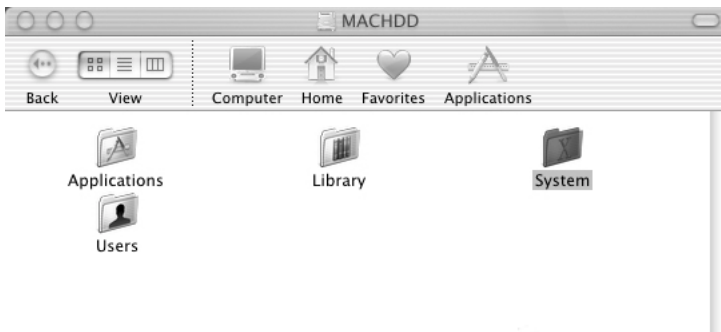
5. Poor external cable problems.

This may happen if the daisy chained with many SCSI device and some of the external cables are not the high density 50 pins (or 68pins UW-SCSI) cables. The 25pin to 50 pins SCSI cable has weak grounding, so if the daisy chained with more SCSI device to system through the 25/50 pins SCSI cable and having intermittent failure, it is recommended that you change this cable with another better quality one.

Appendix 1

Mac OS 10.0.x installtion

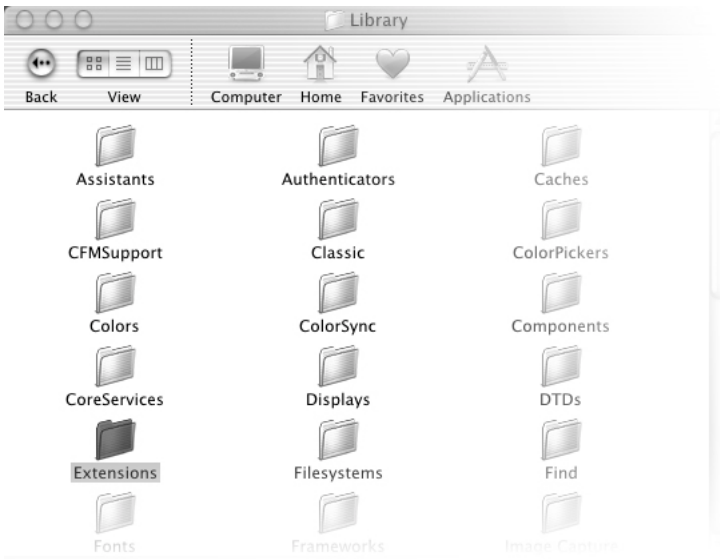
1. Mac OS X Boot up, login as **root**.
2. Find the Mac OS X “System” folder.



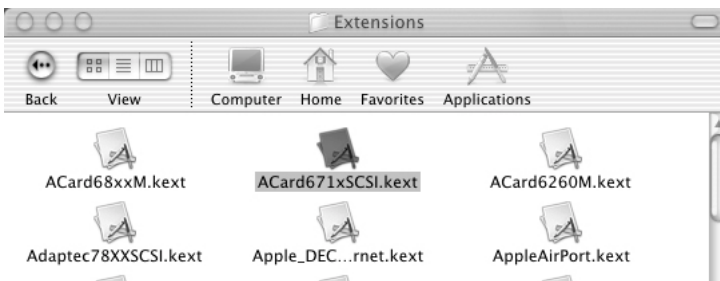
3. Under the “**System**”, find the “**Library**” and click it.



- Under the “**Library**”, fine the “**Extensions**” folder and click it.



- Select “**ACard671xSCSI.kext**” and remove it to **Trash**. Put the new driver into “**Extensions**” folder, then restart the computer.



Note: For the AEC-67160M driver to support Mac OS 10.0.x, download it from www.acard.com/eng/support/mac.html. For Mac OS 10.1 installation, refer to Chapter 3.2.

Appendix 2

Optional SCSI-IDE Bridge Products

Overview

The AEC-7720U/AEC-7720UW Ultra/Ultra Wide SCSI-IDE bridge is dedicate as general-purpose bridge of SCSI (Small Computer System Interface) to IDE (Integrated Device Electronics) interface. With ACARD micro-controller core built-in, it provides more flexibility and stability for highly exploring application.

AEC-7720U/AEC-7720UW supports IDE devices such as hard disk drive, CD-ROM, CD-R, DVD-ROM, etc. which can be easily attached to SCSI bus.

Specification

Environment -	Temperature
Operating	0 ° C to 70 ° C
Storage	-20 ° C to 85 ° C

Humidity - 15% to 90%

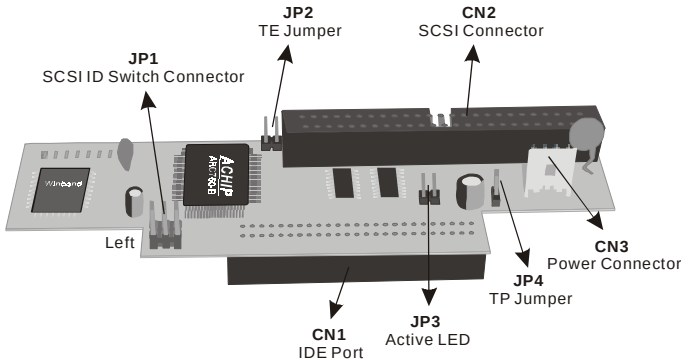
Connector - 50-pin cable (Ultra) / 68-pin cable (Ultra Wide)

Dimensions	7720U	7720UW
- Length:	12cm	8.8 cm
- Width :	3.8cm	3.8 cm
- Height:	2.5cm	2.5 cm

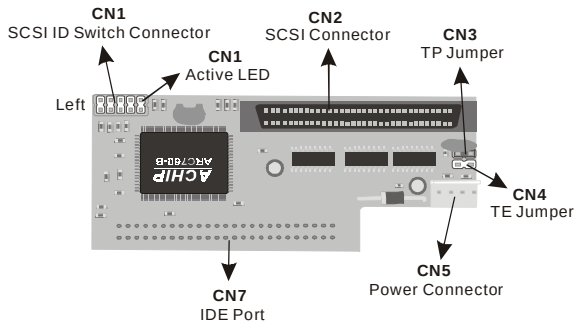
AEC-7720U Bridge Adapter

CN1 - 40-pin female IDE port
CN2 - 50-pin SCSI connector
CN3 - 4-pin DC power connector

JP1 - SCSI ID Switch connector
JP2 - TE jumper, default is ON
JP3 - Activity LED jumper
JP4 - TP jumper, default is OFF

**AEC-7720UW Bridge Adapter**

CN1 - SCSI ID Switch connector & Activity LED jumper
CN2 - 68-pin SCSI connector
CN3 - TP jumper, default is ON
CN4 - TE jumper, default is ON
CN5 - 4-pin DC power connector
CN7 - 40-pin female IDE port



Appendix 3

Technical Support Form

Email: support@acard.com<http://www.acard.com>

Model:	AEC-		F/W Version:	
System Configuration				
Main Board vendor				
BIOS version				
SCSI adapter				
Chipset				
Memory				
Display card				
Other I/O card				
OS version				
Hard Disk Configuration				
Hard Disk Model/type				
Capacity				
Firmware version				
IDE Device Connect				
CD-ROM model				
CD-R model				
MO or Removable HDD				
Others				
Problem Description				

MAL67160ME0X10-0

